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ABSTRACT

The Research Library at Los Alamos National Laboratory (LANL) has been teaching an Internet class to adult learners since May 1994. The weekly class combines lecture, personal anecdote, and teacher demonstration with hands-on practice using Gopher and the World Wide Web. The class, open to any Lab employee or associate, has provided 250 people with the skills to find basic reference materials and navigate the Internet for real work-related needs. Presented in question-and-answer format, the paper addresses: (1) computer background of the staff at Los Alamos; (2) teaching methods; (3) starting out with Gopher in 1994; (4) the shift in emphasis to the World Wide Web; (5) the use of PCs as opposed to Macintoshes; (6) validity of Internet resources; (7) the quickly changing Internet environment; (8) connecting to the Internet from places other than where the training takes place; (9) locating useful sites quickly; (10) varying levels of computer knowledge in classes; (11) enforcement of policy about use of the equipment only for work-related activities; (12) high expectations of information available on the Internet, such as worldwide e-mail directories and full-text reproductions of every journal article; (13) costs for using the Internet; (14) the relative merits of different Internet providers; and (15) search techniques. (SWC)

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TEACHING INTERNET USE TO ADULT LEARNERS:

The LANL Experience

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

The Research Library at Los Alamos National Laboratory has been teaching an Internet class to adult learners since May 1994. The class is a team effort, combining lecture/demo with hands-on practice using Gopher and the World Wide Web.

The idea for the class came from Dan Comstock, a librarian working in CIC-15, Advanced Database & Information Technology. This group is comprised largely of programmers and others with computer backgrounds. There was an awareness in the group that there were vast resources available on the Internet, but no one seemed to know how to access them. With Sharon Smith, an idea was developed to present a class for our co-workers in CIC-15 and the Research Library to familiarize them with the variety of resources available using the Gopher protocol, and how to access them.

What started out as a small short-term project has become a weekly class available to any Lab employee or associate. More than 250 people have been taught to find basic reference materials and to navigate the Internet on the Gopher and World Wide Web. The class is one of the first classes offered by the Research Library to be filled every month, and one Laboratory group has recommended that their staff attend this class in preparation for more advanced Internet and HTML classes as part of their group training. The success of this class spurred development by the Research Library of more specific subject classes using Internet resources, specifically business and general science resources.

We've been asked many questions in the 18 months we've been teaching. We've also asked many questions ourselves. Here are the answers to a few of them:

1. Doesn't everybody in Los Alamos already know about the Internet?

The answer is obviously no. Not everyone who works at Los Alamos is a computer wizard. The technical staff at the Laboratory is made up of physicists, chemists, engineers, material scientists, biologists, mathematicians, computer scientists and others. The support staff includes librarians, accountants, various technicians, secretaries, editors, programmers, technical illustrators, contract specialists, maintenance workers, security personnel, etc. In short, the Laboratory staff consists of all the myriad professions it takes to maintain a large scientific research institution. Our class is open to all.

2. How do you teach your class?

We use humor and personal anecdotes as our primary teaching tools. Personal anecdotes in particular are useful for showing that the teachers use the Internet for real work, that we find it useful, and that we are just as lost as the students are (except that we have a few tricks up our sleeves).

The first half of the class is structured to present key concepts in the lecture/demo, using practical, real-life examples as illustrations. The second half of the class is a hands-on creative play session in which students practice finding or not finding materials on any subject they choose, with assistance from the instructors.

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We use both overhead and computer projectors in the class, using graphics and cartoons to illustrate the major lecture points. For example, we start with a cartoon of a man peeking out from a computer screen, asking the woman at the keyboard, "Excuse me, can you show me the way to the Information Superhighway?" With this, we try to make the students comfortable with the idea that being lost on the Internet is normal. The amount of lecture time often varies because as questions come up during the lecture we incorporate them into the lecture. Today's classroom anecdote is often the next week's lecture point.

3. Why did you start with the Gopher?

The Gopher protocol was at its peak with dozens of new sites appearing every day at the time we began planning the class. It was the fastest and easiest way to access information without having to learn to use commands. The menu structure led people directly to information resources without having to know specific addresses.

Originally we titled this class "Finding Information Resources Via Gopher, or the Luxury Bus Tour of the Information Superhighway." We were using all the popular automotive cliches even before they became popular. We taught from the Los Alamos National Laboratory Gopher, reasoning that our students should know what is available at home before they go out into the world. We began by using a simple telnet connection to Gopher to show the menu structure without a lot of hype, and later we added a quick demo of the menu structure using Hampson's Gopher software.

The main LANL Gopher menu, while possessing many strengths, did not point to a large number of specific subject or reference materials that might be used in a library. Not only did we want to show students how to find some basic sources, but we also wanted to give people the confidence to find and use others.

The Laboratory's Gopher had links to RiceInfo's subject listings, Veronica and Jughead searching, and to worldwide Gopher listings. We used these to help people find resources on specific subjects or information about organizations or locations.

In the fall of 1994, the LANL Research Library also entered the Gopher/Web scene. The Library's Gopher appeared in November, followed directly after by the Library's Web page in December. Both of these have subject listings applicable to Laboratory interests, i.e., physics, chemistry, job listings, etc. We were able to incorporate use of these resources into our class.

For many people at the Laboratory a simple telnet connection is their main access to Internet resources. This is changing over time; however, we still have classes where people only have telnet access.

4. Why did you change to the Web?

As the Internet world changed, our class evolved into a Gopher/Web orientation, and now is taught strictly on the World Wide Web, with Gopher being taught on demand. As media hype and student interest increased, we

began to add a segment on the Web into our classes in late 1994. At that time, the LANL Web was well established, and the Library was starting to develop its own Web page. It has been obvious from the first that the Web is supplanting the Gopher. We are finding new library resources on the Web outnumbering those on the Gopher at about a rate of four to one. People are not posting new things on their Gophers, and what is there is not being maintained as well.

The Web is, in many ways, the Luxury Bus that ran over the Gopher. The LANL Gopher will be phased out in January 1996, and the Research Library will follow suit.

The shift from Gopher to Web has not been easy. We had discussed the Web off and on, but our main objection to the Web was the amount of time it took to load those huge and often extraneous image files. Also, the Gopher environment is more structured, and often easier to understand than the free-form Web. The Gopher, with its strong ties to the university community, often has more solid information coming from more reliable sources, however, the newer information is appearing on the Web, and on the Web alone.

Another factor in favor of shifting to the Web is that Web browsers can read Gopher items, and they do point to good Gopher items.

We use the LANL Home Page as our starting point. We then go to the Research Library's home page, and demonstrate the subject folders that have been created to reflect the work of the Laboratory. From there, we demonstrate various search engines, and talk about other subject resources, such as Yahoo. We have handouts that list URLs for these
searching tools.

5. How do you deal with different computer platforms?

Frankly, we don't. We only have PC clones in the training room. We knew we would have students who only were familiar with the Macintosh environment, and who had never used Windows. Luckily, most Macintosh users adjust quickly. The PCs are connected to the Library's internal network, which includes our CD-ROM databases, connections to other libraries, and word processing software. We wanted the students to focus at the beginning of the class on learning about the Internet, not the internal network, or how to make a PC work. When we start the hands-on phase of the class, we walk the students through the terminal sign-on, and get them to the menu that gives them options for Gopher, Mosaic and Netscape. We stand by to help with questions, dead-ends, and the occasional system reboot.

In the middle of our first summer of teaching, the training room was closed for remodeling. This remodeling is still in progress. We enter the room every week not knowing what will be stored there, or whether the back row will have room for chairs. We currently have five terminals available; classes are limited to ten people, and we ask that they share terminals.

Questions from the Class:

1. You mean just anybody can put up a Web page?

One lesson we try to teach is that the validity of Internet resources isn't always rock-solid. Sources can be accurate, and can be quite good. Sources can also be very wrong. For example, we found a geographical database that gives the altitude of Los Alamos, New Mexico as 575 feet, (the correct altitude is 7,200 feet), and yet this database comes from a major Midwestern university.

Another example is Todd's Atomic Page on the World Wide Web. We don't know who Todd is, or why he is interested in nuclear science, although he does give personal information on his page. We do know that he points to some very good resources, including LANL. We check his page every now and then to see if he has found some good resources that we can use. No offense to Todd, but how do we know how valid his information is?

2. Where is that thing I found last week?

A class on Internet resources is not just created and then taught exactly the same from week to week. The environment is changing far too quickly. Teaching anything about the Internet is like herding cats - you think you've got it under control, and then things start happening. Just as we teach in class, the great resource you found last week has probably moved or disappeared by now. The connections may be down to everything on the East Coast. It may be exam time and all the servers you want to use may be so overloaded they're hemorrhaging bits and bytes all over cyberspace. RiceInfo may have changed its menu structure for the fifth time this week. We try to use these real-world examples to show students that there are many Dead-Ends on the Information Superhighway, they are pretty well unavoidable, and it's best to just laugh a little and try again. We've never made it through a class without at least one.

3. How do I get there from here?

Sometimes you can't. Even if you can, sometimes everything won't work. Individual computer setups are beyond our control. We do not even try to explain to people how to connect to the Internet from their office. We refer students to the Laboratory's computing groups, and to the computer system administrator in their group or area. The Laboratory has no one standard, and individual setups vary from fast network connections down to 1200-baud ASCII dialup terminals. We also are often asked about Internet connections from home. While we can describe in general terms what using a SLIP/PPP connection is like, we suggest the student contact an Internet provider and let them supply the specific answers.

We also do not try to explain things such as e-mail, listservs, Usenet, or other things outside the scope of Gopher/Web. There just are too many ways to access these, and too many variations to be addressed in a general class that only lasts two hours.

4. Where will I find time to search the Net enough to really know how to use it?

We are teaching in a world that demands exploration to people who do not have time to waste; a world that is not organized in any logical fashion - and it is getting bigger by the minute. Our students are people who don't have hours to spend roaming around the Net finding "cool" things to share with their friends. One of the advantages of our hands-on time is that this is time the students already have scheduled to spend on the Net. Our intention is to give students a comfortable look at the Net and give them a few hints on how to search for resources, not to try to list every single good resource for them. Our hand-outs give URLs for a few search engines, subject lists, and listings of Web pages by location.

Often people need information about a specific institution or location. The fastest way to find the phone number for someone on the faculty of a given university is to go to the university's Web page and find the faculty directory. Laboratory employees often travel to other labs or universities to collaborate on experiments with other researchers, so these directories are quite important to them. Basic travel and weather information, hotel and restaurant listings, and transportation guides are also quite useful to them.

5. Will I get hantavirus from the computer mouse?

We assume a basic computer knowledge in our classes, but we often cannot assume that our students have even seen a PC before. The concept of double-clicking with a mouse befuddles the DOS folks; the Macintosh users flinch when they find a training room full of PCs. It is to our advantage that we have backgrounds in both environments, as well as UNIX and VAX/VMS.

On the other hand, there are also people in our classes who may use computer databases every day as part of their job, but haven't had a reason to use databases outside their own home systems. We often digress into explanations of domain names or of each machine/file having a unique address. This is particularly important in teaching the idea of URLs on the Web. We had originally hoped to set up prerequisites for our class, asking that all users have password access to the main Laboratory communications network, and that they have experience using e-mail. These turned out to be too much to ask for. We have had to explain everything from the concept of double-clicking to how to find out online what your own e-mail address is.

If we are faced with basic computer questions during the lecture portion of the class, we often ask the questioner to wait until the hands-on portion of the class so we can give him or her better individual attention. This keeps the class moving. Often, the person sharing the terminal with that person will assist the novice in finding things. This is where our crowded training room becomes an unexpected advantage. It also helps that we work together to answer questions; it gives the class a congenial feel, quite different from the traditional lecture hall atmosphere.

6. Is the Lab really looking at everything I do on the Net?

Another point we try to make is that like Hill Street Blues, you need to be careful out there. Look before you leap. We use the analogy in class that just like when you travel around the world, you will encounter different cultures on the Internet. We are coming from a professional world, with professional standards of work conduct. On the Internet we may find ourselves in places that do not fit those standards, and we will probably end up in those places just when the boss is looking over our shoulder.

LANL does have a policy about use of Laboratory equipment only for work-related activities. This policy is enforced, and yes, they do check. Our network connection to the outside world is monitored closely, and if there is any suspicious activity we are asked to explain. When we stumble into places we shouldn't be, we get out. We encourage our students to do the same. Hopefully we do this in a non-threatening manner. What we stress is that accidentally connecting to Miss Kitty's Pleasure Palace Home Page once and immediately leaving is OK, but connecting to it six times in half a day may not be wise.

7. How do I get my e-mail off the Web? Where is the phone book for Podunk, Iowa?

Students also approach the class with the expectation that will find everything they ever wanted to know, with full text, pictures, and sound clips. One of the first things we explain to them is that copyright law prevents this from happening with most published materials, and a large portion of what is available is either severely limited or is available only to those who pay for access.

An expectation we see in every class is that there will be a magic phone book listing numbers and addresses for everyone in the world. Another is that journal indexes just like those on Dialog and other commercial online systems will be available for free. This sometimes happens for a brief period on isolated systems when a test is being run, but unless you find out before everyone else does and the system is overloaded and shut down,
forget it!

8. Why can't I get my friend's article from the Journal of Applied Esoterica on the Net?

Another expectation we often find in our students is that the full text of every journal in the world is online. These expectations come from the media hype about the Internet that is heard literally every time a TV or radio is turned on. Advertisements from commercial Internet providers add to this myth. Journal publishers will often list their titles as "on the Internet," but in reality only a few articles will be available on the publisher's home page, along with information on how to subscribe.

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9. How do I sign on to the Web at home? I have a really nice TV set I could plug into!

Los Alamos has a high proportion of homes with at least one PC, estimated at 2/3 or higher in recent surveys. We are often asked how to connect to the Net from home so that people can pursue their interests in dog training, Star Trek, or microbreweries. The answer to "how do I connect" is usually "it depends." There are many factors involved, such as what speed the person's modem operates at, if he or she has one at all, availability of a phone line that can be tied up for many hours at a time, etc. The idea that one has to have a computer, a modem, Internet access, software and a phone line to reach the Internet and read the Web can be overwhelming.

10. How much is this costing me?

This question is put to us more often by people who are accustomed to using commercial online services such as Dialog and CompuServe, or who access the Internet from home using a commercial provider. Since LANL pays for our access in the work place, the real costs are transparent to the users and there is no connect-time charge involved. For new users, the idea that the Web is full of commercials and subscription-only databases is often a surprise, but they soon learn that someone has to pay to provide all those pretty pictures.

11. Who's the best Internet provider? Should I use a provider or use America Online/Prodigy/CompuServe?

It is with this question that we most often find ourselves explaining other aspects of the Internet, such as the subtle differences between e-mail and bulletin boards. The concept of a provider is often hard to explain. Providers can give you many things such as electronic mail, news services, and discussion group bulletin boards in addition to Net access. The idea that all these things come over the Internet, and yet may not have access to the Web,
is hard to understand.

Of course, we cannot recommend one provider over another. However, the discussion that ensues from those who do have Internet access at home is always lively. The major concerns are cost for connect time, quality of provider service, and range of services offered.

12. I did a WebCrawler search, and got all these hits. Which one do I choose?

This is probably the most difficult concept we teach: the first result you pick may not be the "right" one. Yet adults often have trouble taking the risk. In many ways this is the last great hurdle to effective Internet use. We must recognize that any one search is not conclusive, and it may take a number of different approaches to get a comprehensive result.

What we have learned about our students:

We are working with adult learners. Not all of us at LANL are rocket scientists -- some of us are plain old librarians or accountants or trainers or editors. But all are bright, literate, well-read adults. Most of those in our classes have been out of school for quite a while. We have to present our material in a clean, clear fashion that recognizes these people have real work-related needs. Not many are in class to find rock lyrics online (although no doubt some have been).

There are no stereotypes in our classes. The prevailing myth is that young people already know about the Internet, and that we older people are resistant to that. That simply isn't so. We get first time users of all ages. Many smaller schools do not have the depth of network connections, so many of our summer students are learning about the Internet for the first time. Some of the most enthusiastic learners are the older scientists who have quite literally seen it all. One of our retired mathematicians, back as a consultant, flipped when he saw how easily he could find information on a research institute in Poland where some of his colleagues worked. He called every day for a week with new discoveries.

We believe our class opens new doors for our students, and enables them to find and open even more. We urge them to explore on their own, and to have fun doing it. The real life learning adventure has just begun for them and for us.